Optimal Insecticide Programs: Field Efficacy Trials

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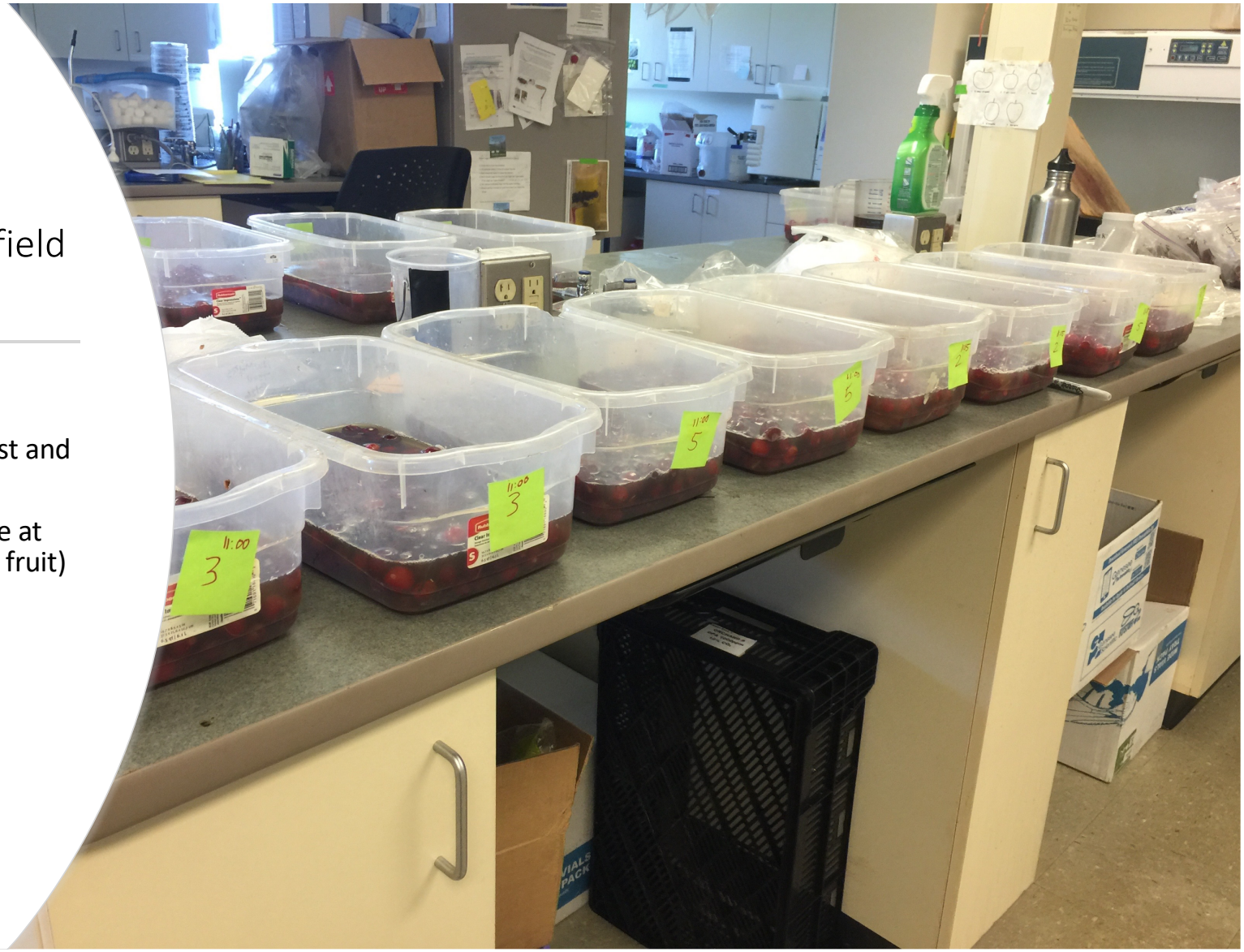
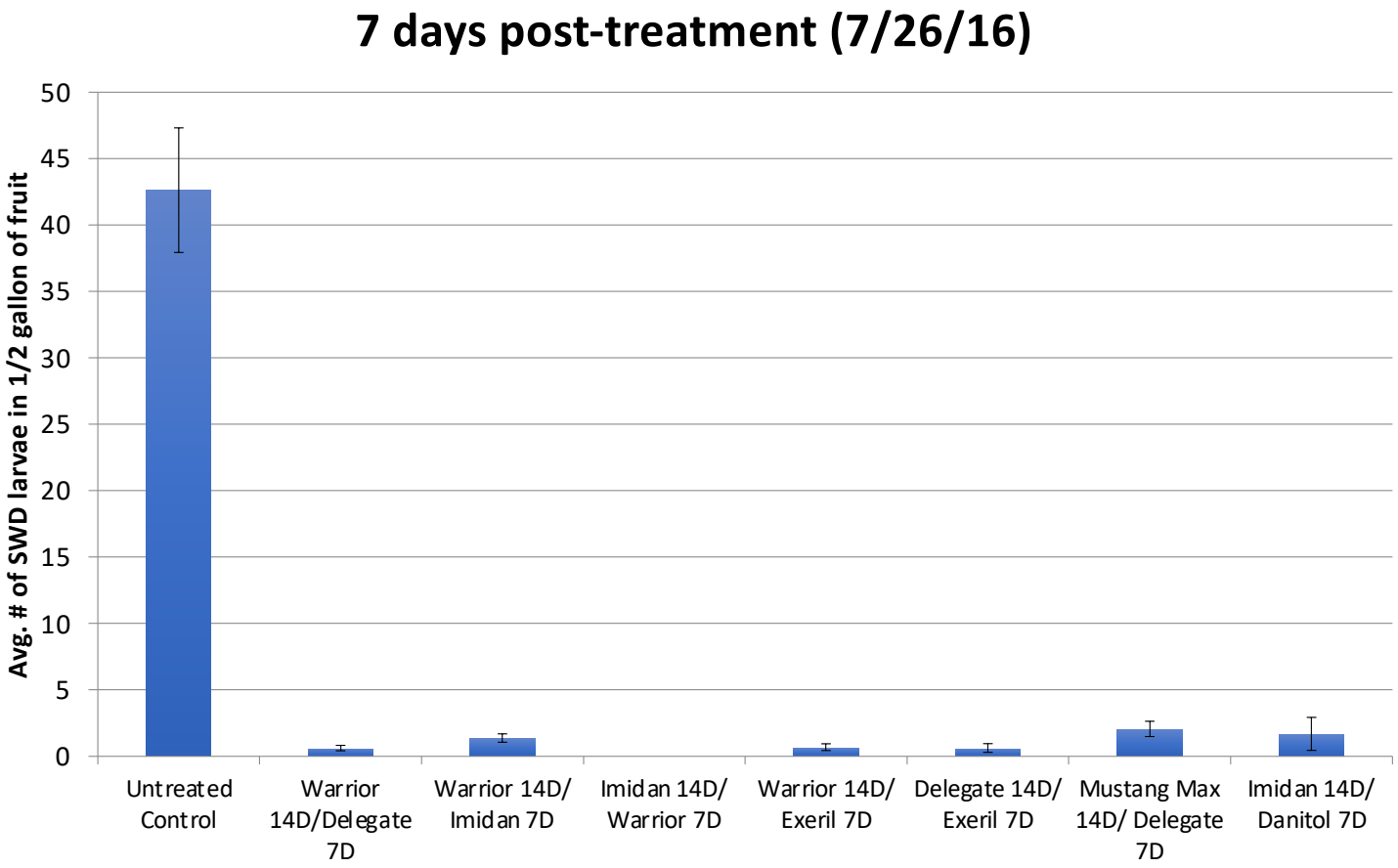
Determine optimal insecticide programs: field efficacy trial 2016

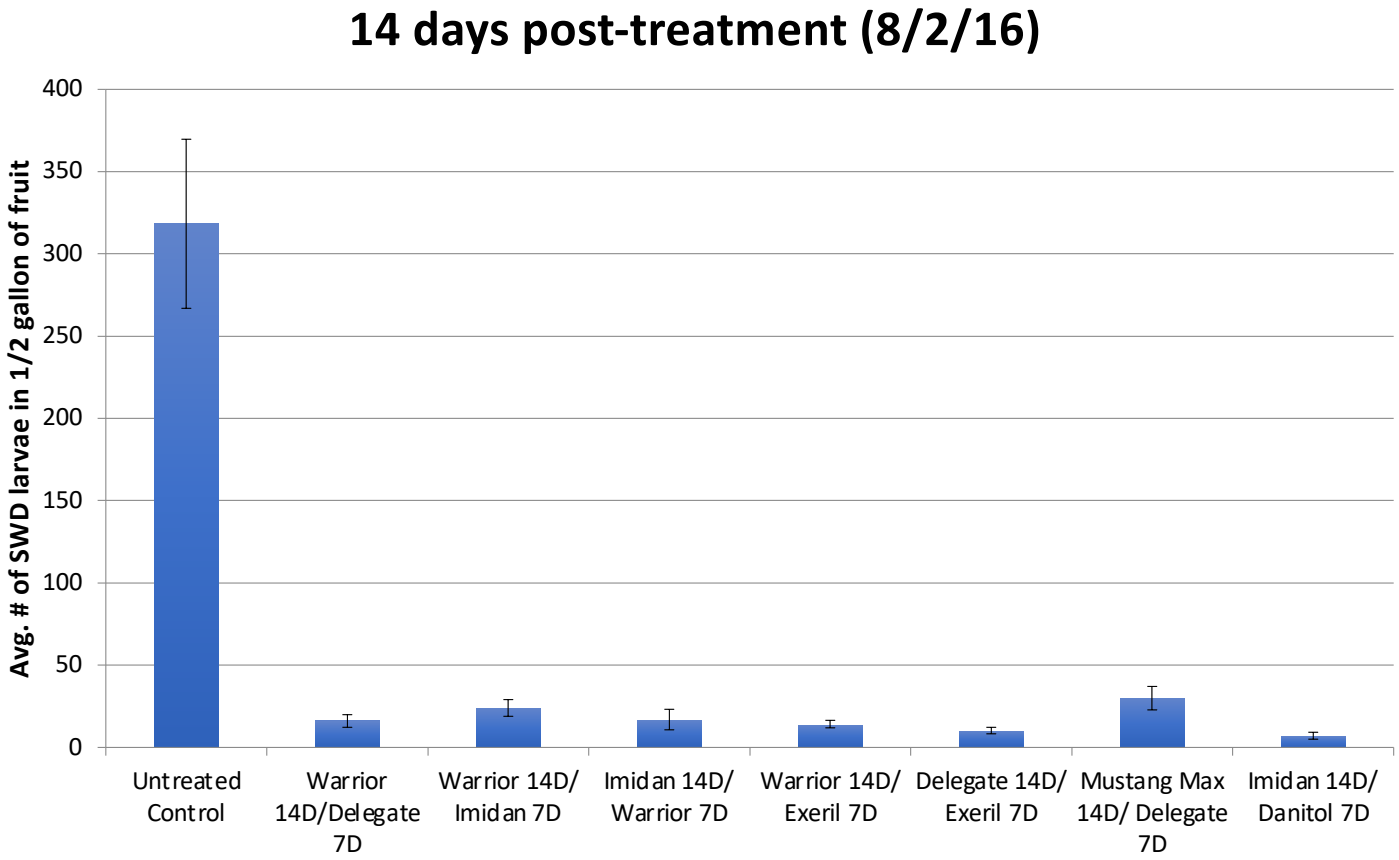
- Tested 8 programs
- Two fruit collections – harvest and 7D post harvest
- 128 samples tested for larvae at each timing (or 64 gallons of fruit)

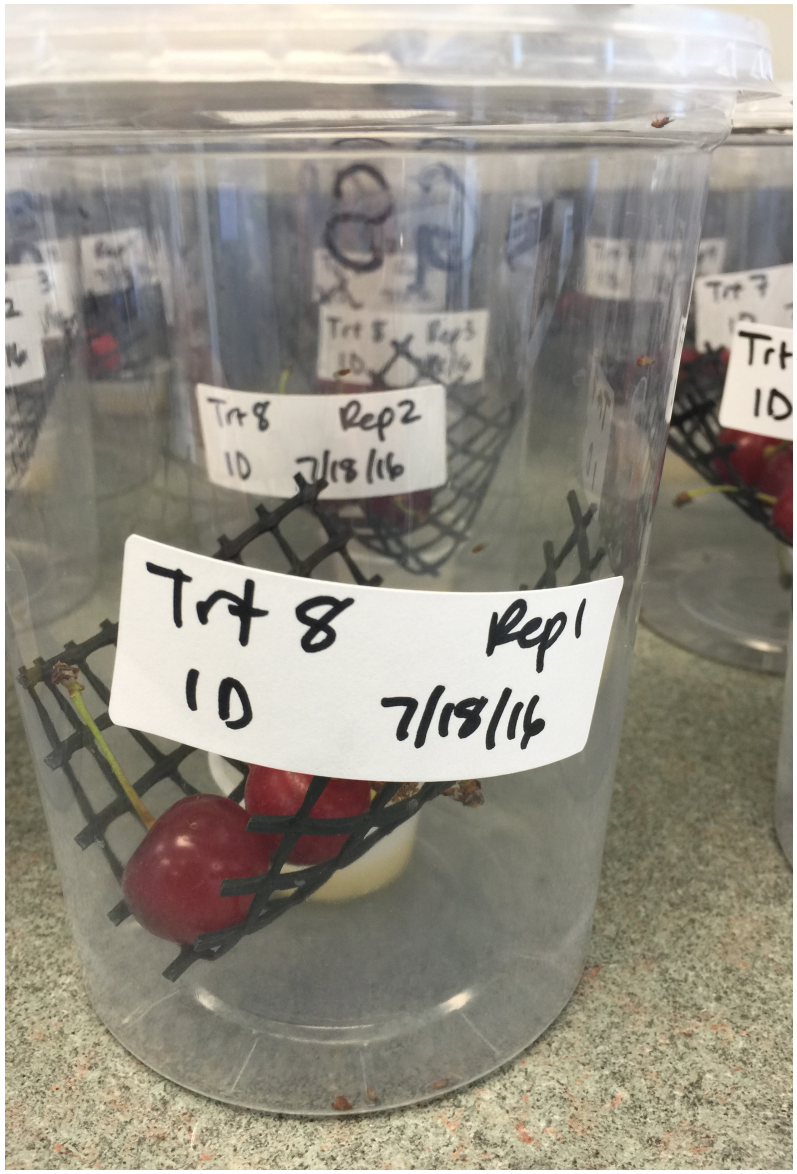


Field Efficacy Trial



Field Efficacy Trial

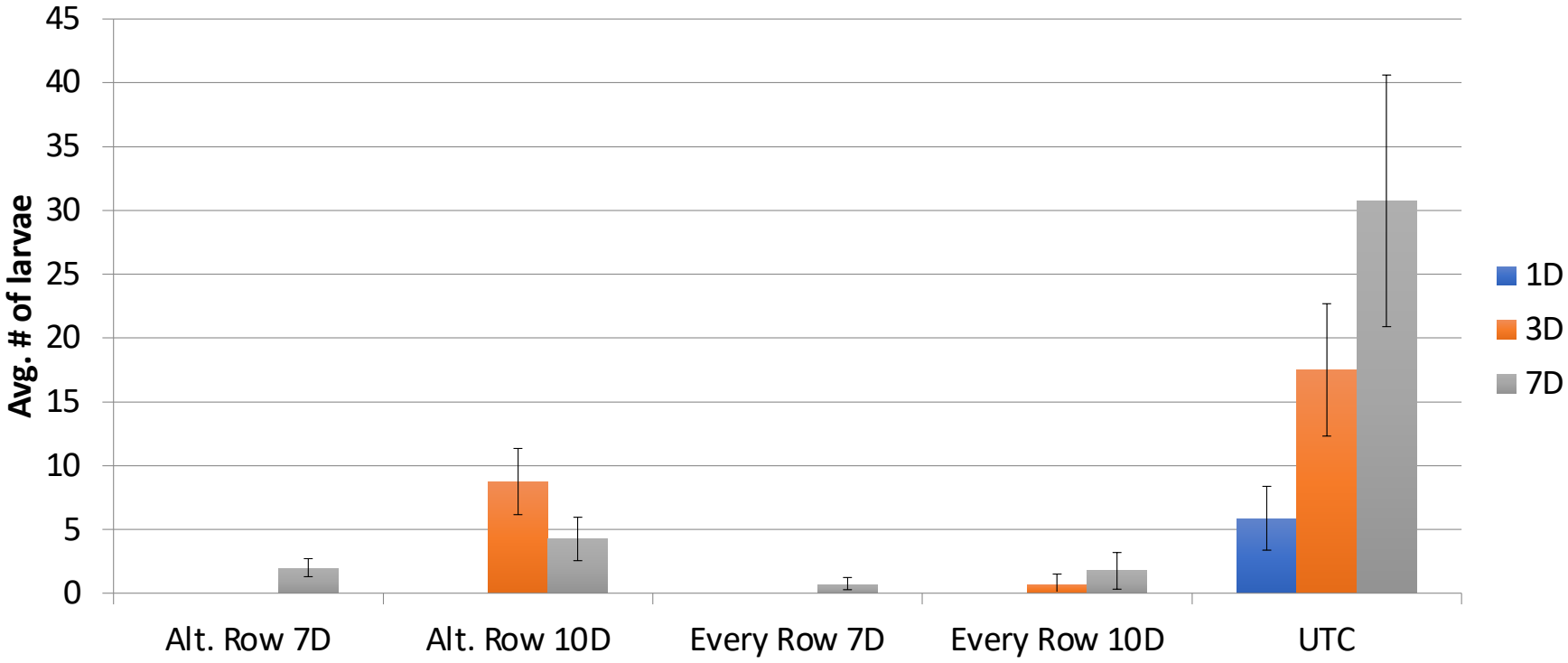




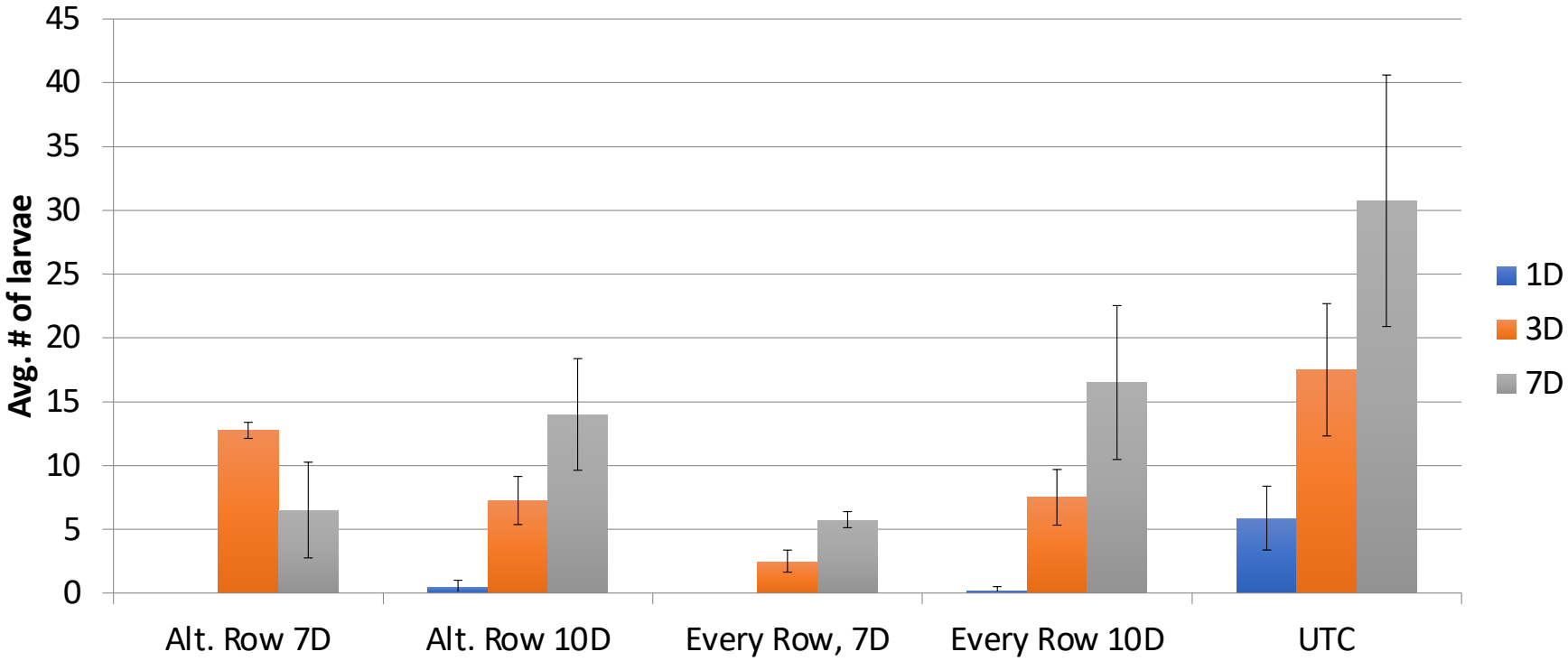
Spray Regime Trial

- Alt. row vs. full cover, at 7 and 10D
- 3 insecticides
- Bioassays 1D, 3D, 7D, 14D
  - Harvest fruit from treated tree
  - Place into deli cup and expose to 5 male and 5 female SWD adults
  - Sample fruit after 8D for larvae

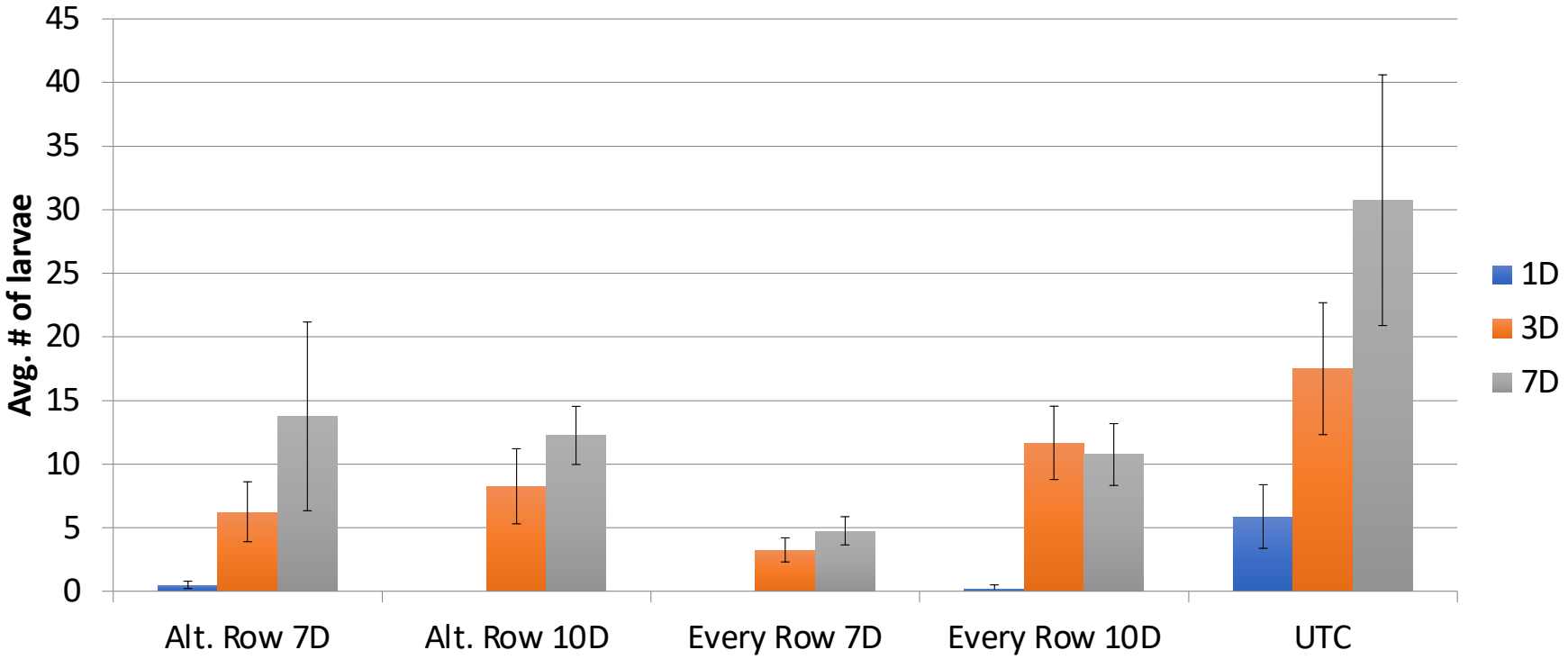
Spray Regime Trial - Imidan



Spray Regime Trial - Baythroid



Spray Regime Trial - Delegate



Efficacy Trial Goal for 2017

- Develop insecticide spray programs that include tank mixes to maximize residual in the orchard to reduce spotted wing drosophila (SWD), *Drosophila suzukii,* infestation.

- Conducted trial on 7-year old Montmorency trees
- Airblast sprayer @ 60gpa

Insecticide Treatments

- Exirel 17D / Imidan 10D / Exirel 3D
- Delegate 17D / Imidan 10 D / Mustang Max 3D
- Delegate 17D / Imidan 10 D / Danitol 3D
- Exirel 21D / Imidan 14 D / Exirel 7D
- Imidan 21D / Mustang Max 14 D / Imidan 7D
- Harvanta 21D / Imidan 14 D / Harvanta 7D
- Mustang Max + Assail 20D / Mustang Max + Assail 10D
- Mustang Max + Harvanta 20D / Mustang Max + Harvanta 10D
- Mustang Max + Imidan 20D / Mustang Max + Imidan 10D
- UTC

Table 1. Efficacy Results from NWMHRC; Harvest Sample (7/24/17)

Treatment	Avg. # of larvae in 3 gallons of fruit	Fisher's PLSD (0.05)
Delegate 17D / Imidan 10D / Danitol 3D	0	a
Exirel 21D / Imidan 14D / Exirel 7D	0	a
Mustang Max and Harvanta 20D / Mustang Max and Harvanta 10D	0	a
Mustang Max and Imidan 20D / Mustang Max and Imidan 10D	0.25	ab
Mustang Max and Assail 20D / Mustang Max and Assail 10D	0.25	ab
Imidan 21D / Mustang Max 14 D / Imidan 7D	0.25	ab
Delegate 17D / Imidan 10D / Mustang Max 3D	0.5	ab
Harvanta 21D / Imidan 14D / Harvanta 7D	0.5	ab
Exirel 17D / Imidan 10D / Exirel 3D	1	ab
Untreated Control	5.5	c

Table 2. Efficacy Results from NWMHRC; 1 week Post-Harvest Sample (7/31/17)

Treatment	Avg. # of larvae in 3 gallons of fruit	Fisher's PLSD (0.05)
Delegate 17D / Imidan 10D / Danitol 3D	1.5	a
Exirel 17D / Imidan 10D / Exirel 3D	2.5	ab
Exirel 21D / Imidan 14D / Exirel 7D	2.75	ab
Mustang Max and Harvanta 20D / Mustang Max and Harvanta 10D	7.25	b
Mustang Max and Imidan 20D / Mustang Max and Imidan 10D	7.25	b
Delegate 17D / Imidan 10D / Mustang Max 3D	7.25	b
Mustang Max and Assail 20D / Mustang Max and Assail 10D	8.5	b
Harvanta 21D / Imidan 14D / Harvanta 7D	15.25	bc
Imidan 21D / Mustang Max 14D / Imidan 7D	15.5	bc
UTC	154.75	c

Efficacy Results

- All treatments were significantly different than the UTC in the harvest timing sample
  - 1) Delegate 17D / Imidan 10D / Danitol 3D, 2) Exirel 21D / Imidan 14D, and 3) Mustang Max and Harvanta 20D /Mustang Max and Harvanta 10D = no larvae
- Jet Ag at a 1% solution followed by Delegate improved the efficacy of Delegate compared to Delegate alone
- Yeast did not improve the efficacy
- One week post harvest sample Delegate 17D / Imidan 10D / Danitol 3D was numerically best program
- Exirel 17D / Imidan 10D/ Exirel 3D and the Exirel 21D Imidan 14D / Exirel 7D programs had statistically fewer larvae
- Good efficacy results in trees with small canopies

SWD Efficacy Trial 2019

- Imidan applied at the following timings
- Applied to 15 tree plots with Airblast at 60 gal/A
- 3 gallons of fruit collected at harvest per rep and tested for larvae

	Treatments	Avg. # of larvae	error
1	petal fall, shucksplit, 1st cover, 2nd cover, 3rd cover, 4th cover, pre-harvest	0.04	0.04
2	shucksplit, 1st cover, 2nd cover, 3rd cover, 4th cover, pre-harvest	0.04	0.04
3	1st cover, 2nd cover, 3rd cover, 4th cover, pre-harvest	0.00	0.00
4	2nd cover, 3rd cover, 4th cover, pre-harvest	0.04	0.04
5	3rd cover, 4th cover, pre-harvest	0.04	0.04
6	4th cover, pre-harvest	0.04	0.04
7	pre-harvest	0.13	0.07
8	Untreated control	15.50	4.94

SWD Efffficacy 2020

- Field test prototype SWD phenology model
- Verdepryn applied every 7D starting:
  - 550 GDD base 4C from bloom
  - 650 GDD base 4C from bloom
  - 750 GDD base 4C from bloom
- Applied to one whole row with 3 row buffer on either side, with Airblast sprayer at 60 gal/A
  - 4 replications
- Fruit was hand collected and processed for larvae using the brown sugar extraction method

Results

Treatment	Verdepryn spray dates	total # larvae	avg # larvae per 1/2 gallon	error
utc		1004	41.83	9.359
start 550 GDD	7/1, 7/8, 7/15, 7/22	24	1.00	0.313
start 650 GDD	7/8, 7/15, 7/22	35	1.46	0.208
start 750 GDD	7/15, 7/22	34	1.42	0.329

Rain Events	inches
10-Jul	0.46
15-Jul	0.13
16-Jul	0.74
19-Jul	1.88
22-Jul	0.32